

Poor Smokers, Poor Quitters, and Cigarette Tax Regressivity

Dahlia K. Remler, PhD

The traditional view that excise taxes are regressive has been challenged. I document the history of the term *regressive tax*, show that traditional definitions have always found cigarette taxes to be regressive, and illustrate the implications of the greater price responsiveness observed among the poor. I explain the different definitions of tax burden: accounting, welfare-based willingness to pay, and welfare-based time inconsistent. Progressivity (equity across income groups) is sensitive to the way in which tax burden is assessed. Analysis of horizontal equity (fairness within a given income group) shows that cigarette taxes heavily burden poor smokers who do not quit, no matter how tax burden is assessed. (*Am J Public Health*. 2004;94:225–229)

THE TRADITIONAL VIEW OF

economists is that cigarette taxes are highly regressive.^{1–4} A regressive tax is one for which the poor pay a higher percentage of their income in taxes than do the rich⁵—a tax that hits the poor more than the rich. The regressivity of cigarette taxes has not been considered very important, because it is the *overall* progressivity of the tax system that matters, and cigarette taxes have represented a small part of total tax payments. However, recent dramatic increases in cigarette taxes have made regressivity a more pressing issue. For example, New York City's new combined city, state, and federal cigarette taxes are \$3.39 per pack, making the tax bill more than \$1200 per year for a pack-a-day smoker—real money to many poor people.

Public health advocates generally support high cigarette taxes because of the harm that smoking does to both smokers' health and that of others. According to economic analysis, the size of the cigarette tax should be determined by the extent of the net damage done to nonsmokers—the “negative external effects” of cigarettes, which include extra use of medical care, environmental tobacco smoke exposure, and so on.^{6,7} However, New York City's cigarette taxes are higher than needed to address these external effects and are intended to get smokers to quit.⁸ The regressivity of cigarette taxes, not these other issues, is the focus of this article.

Cigarette taxes have been found to be regressive for 2 rea-

sons. First, sales taxes are generally regressive because the rich save and invest a larger share of their income than the poor, and so the poor spend a larger share of their income on consumption.^{4,9,10} Cigarette taxes are examples of excise taxes, taxes on the sale of a specific commodity or service. Unless a good is disproportionately consumed by the rich, an excise tax on that good will be as regressive as a general sales tax. Second, since the prevalence of smoking is higher among the poor, cigarettes are in fact disproportionately consumed by the poor.^{11,12}

Some advocates of high cigarette taxes acknowledge their regressivity but focus on other ways to make the overall tax system progressive or help the poor and consider the regressivity of cigarette taxes a bad feature to be traded off against their good features.¹³ However, other advocates of high cigarette taxes have attempted to challenge the regressivity label directly and portray cigarette taxes as progressive.^{14–16}

Most of the regressivity controversy focuses on how to treat behavioral change, the extent to which higher taxes cause smokers to quit or cut back. If people are “forced” to quit as a result of higher prices, are they better off? If a high cigarette tax forces the poor to cut back by more than the rich cut back, have the poor benefited more from the tax than the rich? In fact, higher cigarette prices do cause the poor to cut back on smoking more so than the rich.^{17,18} Since, by defi-

nition, the poor have less money to spend than the rich, higher prices generally affect the poor more than the rich in regard to any good, whether dental care, cars, fresh fruit, or junk food. Could high taxes on any good be characterized as progressive? Or high taxes on any good that harms health?

It is critical that public health advocates understand the various definitions of progressivity, since definitions may have unanticipated implications. This article has 3 purposes. First, it documents the history of the use of the terms *progressive tax* and *regressive tax* by economists, particularly as these terms are applied to cigarette taxes. Second, it explains the various progressivity definitions being applied to cigarette taxes: standard income-share accounting, welfare-based willingness to pay, and the time-inconsistent welfare-based definition. Third, it explores the potential implications of these definitions.

CIGARETTE EXCISE TAXES AND THE TERM REGRESSIVE: A HISTORY

The use of the terms *progressive* and *regressive* applied to taxes dates from the end of the 19th century.^{19,20} The main focus was initially on income taxes: whether or not to have them and, if so, at what rate. Excise taxes were common at the time, mostly imposed on goods favored by the rich, and they were not a focus of the tax

progressivity discussion. Throughout most of the 20th century until very recently, excise taxes decreased in importance in the United States, and, judging by the absence of articles on the subject, their progressivity was not generally a concern.

However, the progressivity of the tax system overall was a major concern in the 1960s and 1970s. In an extensive study conducted by the Brookings Institution,^{9(p1)} “a tax is [defined as] regressive when the ratio of tax to income rises as incomes rise . . . [and] is [defined as] progressive when the ratio . . . falls.” I refer to this definition as the *accounting definition*.

The Brookings study’s methods involved predicting changes in prices and income due to tax changes, and the authors assumed that each 1-cent increase in an excise tax resulted in a 1-cent increase in the net price paid by consumers. However, they made “no attempt . . . to measure the burden that results from . . . the changes in consumption patterns that may be caused by taxation . . . [disregarding] these effects . . . because they are believed to be small and difficult to measure.”^{9(p3)} Thus, the kinds of behavioral responses to taxes emphasized by high cigarette tax supporters were not included. The Brookings study found that “sales and excise taxes are clearly regressive throughout the entire income scale, [beginning] at over 9% of income at the bottom and [declining] to about 1% at the top.”^{9(p58)} However, excise taxes represented a small portion of overall taxes and were not a major concern.

A 1979 study conducted by Browning and Johnson challenged the conventional wisdom regarding US tax progressivity.²¹

They acknowledged that, in the case of excise taxes, lower income groups spend a larger share of their income on taxed goods such as tobacco but considered the impact quantitatively small. Their empirical calculations *assumed* that different income groups spend the same shares of their income on the various goods, and consequently excise taxes could not have different effects on different income classes.

Pechman updated the Brookings study in 1985, and again excise taxes were not a focus.¹⁰ Despite technical advances in methods, the bottom-line finding regarding excise tax regressivity remained unchanged. However, Pechman also noted that excise taxes might not be as regressive as suggested by calculations based on annual income if they were instead measured relative to lifetime income. Lifetime income would be considered a better measure of overall economic status, in that income varies across time as a consequence of both random variation and the systematic rises and falls expected over any lifetime. If consumption of cigarettes and other taxed goods does not vary as much as income, then using annual income as a base would result in excise taxes appearing excessively regressive. Poterba found some support for this notion.²²

In contrast to earlier studies, a 1990 Congressional Budget Office report *did* assume that consumption behaviors would change in response to taxes.¹ In particular, the authors of the report assumed that a 16-cent increase in the cigarette tax (in 1990 dollars) would result in a 4% to 8% decrease in cigarettes consumed, but they did not assume that this response would vary across income

groups. Their overall conclusion was that cigarette taxes were regressive. They noted that if expenditures, because they more closely reflect lifetime income, are a more appropriate denominator than income for measuring progressivity, excise taxes might be less regressive.

In 1993, Fullerton and Rogers updated the Brookings Institution study of the overall progressivity of the US tax system, incorporating several methodological advances, including careful characterization of lifetime income.⁴ In the case of cigarette excise taxes, there were 2 important advances. First, consumption of all goods was allowed to respond to the taxes, incorporating the reduced consumption that taxes cause. Second, the analysis of progressivity involved the use of a welfare-based measure focusing on how taxes affect the “utility” or overall welfare of individuals rather than the earlier accounting measure based on taxes paid relative to income.

In general, greater consumption of goods results in higher welfare. The welfare-based measure allowed Fullerton and Rogers to consider the lowered welfare resulting from the decreased consumption of goods caused by higher taxes on those goods, providing more conceptual validity than the accounting definition. They found that “per capita EV [equivalent variation, a measure of welfare] dollar amounts are similar for the first ten lifetime income categories, suggesting that these taxes are regressive in relative terms for 90% of the population.”^{4(p174–175)} Thus, none of the methodological innovations undermined previous conclusions regarding the regressivity of excise taxes.

Lyon and Schwab focused exclusively on cigarette and alcohol taxes in an attempt to determine whether the use of lifetime income substantially changed the usual conclusions regarding regressivity.¹¹ They found that it “cause[d] little change in the assessment of the incidence of taxes on cigarettes”^{11(p389)} and that cigarette taxes are substantially regressive. According to the most recent Congressional Budget Office study (2001), “[Federal] excise taxes claimed five times the share of income from the lowest-income households that they claimed from the highest-income households.”^{2(p10)} This analysis did not include state and local excise taxes and did not allow for changes in consumption patterns due to taxes.

In summary, until very recently the consensus of the empirical literature was that cigarette taxes were clearly regressive, whether measured relative to current income, lifetime income, or expenditure; whether consumption changes were incorporated or not; and whether an accounting or welfare-based definition was used. However, the small relative magnitude of cigarette taxes made their regressivity unimportant. Advocates of very large cigarette tax increases were vulnerable to the charge that such increases would be highly regressive.

TAX INCREASES, BEHAVIORAL RESPONSES, AND PROGRESSIVITY CALCULATIONS

In contrast to a welfare-based definition of progressivity, the conventional accounting definition of progressivity, based on taxes paid relative to income combined with a focus on tax *in-*

creases, may result in determinations of progressivity that conflict with our instinctive sense of what *progressive* means. In “The Economics of Tobacco: Myths and Realities,” Warner states that it is a myth that a large tobacco tax “is fundamentally unfair because its burden would fall disproportionately on the poor”; instead, “a tax *increase* may *not* be regressive.”^{23(p83)} This argument is based on the fact that the poor are more price responsive than the rich, and so they are more likely to quit or cut back than the rich. If the poor cut back enough relative to the rich, the change in tax expenditures of the poor can be lower than the change in tax expenditures of the rich (and it can conceivably be negative).

Indeed, the evidence is that the poor are more price responsive.^{17,18,24,25} Therefore, standard calculations of cigarette tax regressivity, based on the assumption of equal response (if any response) by all income classes, are systematically biased toward revealing greater regressivity than actually exists.²⁶ While this point is technically correct, it is important to really understand what drives it, because it can have implications that conflict with our intuitive sense of what is progressive or regressive.

Two factors determine the relative magnitudes of different groups’ changes in excise tax expenditures as a share of income: relative sensitivity to price and relative budget shares. In the case of most goods, the poor are more price sensitive than the rich and will cut back on consumption more than the rich. Consequently, their tax expenditures will increase to a lesser degree than those of the rich. On that basis, a tax increase *on any good* is driven toward progressivity. On the other

hand, the poor are likely to spend a greater share of their income on any consumption good, driving any excise tax increase toward regressivity. The balance of these factors determines whether a tax increase is progressive or regressive, making the relative sizes of the behavioral responses by rich and poor critical.

Economists generally measure price sensitivity in terms of elasticity; in the case of cigarettes, the elasticity of demand would be the percentage change in cigarettes consumed resulting from a 1% increase in price. An elasticity of zero means that no change in quantity whatsoever results (i.e., consumption is completely insensitive to price). An elasticity of -1 results in no change in expenditure, because cigarette consumption decreases just enough to compensate for the price increase. An elasticity of a magnitude greater than 1 results in such a large cutback in purchases that total expenditures fall. At a sufficiently high elasticity magnitude—greater than 1 for a 100% tax rate—the tax payments of the poor could conceivably fall as a consequence of the tax increase.

Addictive goods are traditionally thought to involve very inelastic demand. Overall, the empirical evidence suggests that elasticity of demand for cigarettes is approximately -0.3 to -0.5 , implying that cigarette consumption is fairly insensitive to price but certainly not completely insensitive.²⁶ For cigarette tax increases to be regressive would require the poor’s elasticity to be at a magnitude greater than two thirds.

To illustrate how the conventional accounting definition of progressivity, combined with a focus on tax *increases*, can conflict with our instinctive sense of the meaning of *progressive*, con-

sider the following, somewhat exaggerated example of the food situation in poor countries. Suppose the poor have an elasticity of -1.0 , because they have no ability to cut back on other expenditures such as travel to work. In contrast, the rich have a price elasticity of demand for food staples that is essentially zero; they buy the same amount of food no matter what price changes occur. Depending on budget shares, a tax increase could cause the share of income spent on food taxes to rise by more for the rich than for the poor, because the poor cut back on food to such a large extent. According to the accounting definition of progressivity, this tax *increase* would therefore be “progressive,” even though it is taking food from the mouths of poor people who cannot afford to pay more.

Regardless of the extent to which people cut back on consumption as a result of higher taxes and the numbers that ensue, standard intuition would tell us that those people are worse off because they can no longer afford something they wanted to have. A true measure of the burden of taxes would incorporate such effects.

FROM BEHAVIOR TO WELL-BEING

Indeed, standard theoretical methods of analyzing the burden of taxes (tax incidence) *do* incorporate such effects.⁵ Economists make welfare calculations based on consumers’ willingness to pay for a good, which is assumed to reflect that good’s value to consumers. According to this analysis, an excise tax hurts consumers in 2 different ways. First, to the extent that people continue to consume but pay higher net

prices, they are worse off. This effect is captured in the accounting measure of progressivity. Second, consumers who purchase less or stop purchasing altogether also become worse off, because they no longer get the value of what they wanted to consume. This effect is not captured in the accounting measure. A welfare-based measure would capture the harm done to poor people by raising food taxes so that they are forced to cut back on food.

In the case of cigarettes, standard measures of welfare may not be used or emphasized because of concerns that the addictiveness of cigarettes implies that individuals’ willingness to pay for them does not measure the value of cigarettes to these individuals.^{1,27} However, some economists have found that addiction would not undermine the conventional economic analysis.^{24,28,29}

Recently, the notion that willingness to pay for cigarettes is not a valid measure of their value to smokers has been bolstered by the new field of behavioral economics.^{30–33} Behavioral economics is heavily based on the psychology literature. According to this perspective, smokers really want to quit but cannot or do not, and thus they want a commitment mechanism that forces them to do what they really want to do in the long run. These are called time-inconsistent preferences. This framework is an extension of the concept of externalities, harm done to others, to the concept of “internalities,” harm done to oneself not captured in willingness to pay.³²

Behavioral economics has been challenged, both generally and specifically in regard to cigarettes,³⁴ because much of the evidence is based on laboratory ex-

TABLE 1—Effects of Higher Cigarette Taxes on 3 Types of Smokers, Measured Under 3 Alternative Methods of Assessing Tax Burden

	Response to Tax Increase	Accounting (Income Share) Tax Burden	Willingness-to-Pay Welfare-Based Tax Burden	Time-Inconsistent Welfare-Based Tax Burden
Smoker A	Quits	Better off	Worse off owing to cigarette consumption decrease Better off owing to lower tax bill Overall worse off since not compensated for being forced to quit	Better off owing to commitment device: eventual gains of quitting outweigh costs of quitting
Smoker B	No change in smoking	Worse off	Worse off owing to higher expenditures on cigarettes	Worse off owing to higher expenditures on cigarettes
Smoker C	Cuts back to keep tax expenditures constant	Same as before	Worse off owing to both higher price paid per cigarette and cutting back on cigarette consumption	Somewhat better off owing to commitment device: eventual gains of quitting outweigh costs of quitting

periments and surveys. Laboratory experiments may be misleading if people make very different decisions when real money and real-world outcomes are at stake. Surveys may be misleading if respondents answer in such a way as to please the interviewer.

Gruber and Koszegi showed that if progressivity is calculated through the use of welfare-based concepts and if individuals are indeed sufficiently “time inconsistent,” then the poor benefit more than the rich from cigarette taxes, and the taxes are “progressive.”³⁵ The idea is that all smokers would like a commitment mechanism to force them to stop smoking, but taxes only work as such a mechanism in the case of the poor.

Even if this analysis is correct, and the poor benefit more than the rich from cigarette taxes, there are drawbacks to using Gruber and Koszegi’s methods for calculations of progressivity. Many assumptions about both behaviors and preferences are needed, the validity of these assumptions is highly uncertain, and the methods themselves are quite complex; as a result, the calculation is essentially a “black box” to many interested parties and is more easily subject to agenda-driven manipulation.

INEQUITY AMONG THE POOR: SMOKERS AND NONSMOKERS, QUITTERS AND NONQUITTERS

While progressivity and regressivity focus on how tax burdens are distributed across income classes, society is also concerned with how tax burdens are distributed within a particular income class. Horizontal equity means treating people in equal circumstances equally. This issue has never been a focus of the discussion regarding cigarette taxes, but perhaps it should be.

There are smokers and non-smokers among the poor. Obviously, 2 individuals who are at the same income level but differ in their smoking status are treated differently. Should these individuals be considered equals? Is it right to burden the smoker more?

Even if one accepts the idea that a higher cigarette tax is beneficial overall to poor individuals who quit smoking, it is a burden on those who do not quit. Consider the issue of a cigarette tax increase and how 3 kinds of smokers are affected. Smoker A responds by quitting, eliminating the financial burden of cigarette taxes. Smoker B continues to smoke the same amount and

thus is hurt financially. Smoker C cuts back just enough so that he or she spends the same amount on cigarette taxes.

What do alternative ways of looking at the burden of cigarette taxes say about this? According to the accounting measure, the smoker who quits is better off, the one who does not quit is worse off, and the one who cuts back just enough to keep tax expenditures constant is as well off as before. According to the traditional welfare-based measure, all smokers are worse off because they face some combination of higher cigarette expenditures and reduced consumption of a good they would have chosen to consume. According to the time-inconsistent welfare-based measure, the smoker who quits is better off for having been forced to quit, the one who does not quit is clearly worse off, and the smoker who cuts back just enough to keep expenditures constant is better off: happier for having been forced to cut back (Table 1). Whatever view one takes of how to measure tax burden, smokers who do not respond by quitting or cutting back become worse off, and thus cigarette taxes do not have desirable horizontal equity characteristics.

IMPLICATIONS AND CONCLUSIONS

The recent political fervor and consensus behind high cigarette taxes are driven by a seeming win-win situation. To the extent that cigarette smokers are not responsive and keep smoking, the government has a good source of revenue available from people who have chosen to do something “bad.”³⁶ On the other hand, to the extent that high cigarette taxes result in less smoking, the health of the public has been improved. New York City’s mayor declared that “if it were totally up to me, I would raise the cigarette tax so high the revenues from it would go to zero.”⁸ With such politically painless taxes available, the issue of regressivity has received only limited attention. The issue of the horizontal equity of cigarette taxes—fairness among people of similar incomes—has received essentially no attention.

Most empirical evaluations of tax progressivity define a progressive tax as one in which tax expenditures as a share of income fall as income rises—an accounting definition of progressivity. Many such calculations assume that there is no behavioral response: no reduced smoking due to higher cigarette taxes.

Even those calculations that do consider such responses do not consider the greater responsiveness of poorer smokers. Incorporating such differential responsiveness would make cigarette tax increases less regressive. If responsiveness to price differs sufficiently among different income groups, a tax increase could conceivably even be "progressive" according to the standard accounting definition of progressivity, despite the higher prevalence of smoking among the poor.

The fact that the poor smoke more than the rich means that they either will be paying more in taxes or will be "forced" to cut back more. In general, economists respect people's choices. If they prefer to buy something and it is made too expensive for them, we say that they are worse off. The standard accounting definition of progressivity neglects this harm but nonetheless finds cigarette taxes regressive. A welfare-based measure of progressivity includes the harm of forced cutting back, exacerbating the regressivity of cigarette taxes. If smokers' preferences are truly and sufficiently time inconsistent—something that is unknown—then including these preferences in a welfare-based measure could make cigarette taxes progressive.

Whatever view one takes of how to define progressivity and determine the welfare consequences of cigarette taxes, horizontal equity—fairness within a given income class—has been neglected. People respond differently to tax increases: some will quit, others will cut back, and still others will not change their smoking behavior at all. Higher

cigarette taxes cause hardship among some poor individuals who find it difficult to quit. In the drive for better public health, we should acknowledge the price paid. Standard principles for assessing the equity of taxes should not be forgotten. ■

About the Author

The author is with the Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY.

Requests for reprints should be sent to Dahlia K. Remler, PhD, Department of Health Policy and Management, Mailman School of Public Health, Columbia University, 600 W 168th St, New York, NY 10032 (e-mail: dr404@columbia.edu).

This article was accepted July 16, 2003.

Acknowledgments

I would like to thank Ronald Bayer for suggesting this topic and Ronald Bayer, Sherry Glied, and Jonathan Skinner for helpful discussions and comments on earlier versions.

Human Participant Protection

No protocol approval was needed for this study.

References

1. *Federal Taxation of Tobacco, Alcoholic Beverages and Motor Fuels*. Washington, DC: Congressional Budget Office; 1990.
2. *Historical Effective Tax Rates, 1979–1997*. Washington, DC: Congressional Budget Office; 2001.
3. Evans W, Ringel J, Stech D. Tobacco taxes and public policy to discourage smoking. In: Poterba J, ed. *Tax Policy and the Economy*. Cambridge, Mass: MIT Press; 1999:1–56.
4. Fullerton D, Rogers DL. *Who Bears the Lifetime Tax Burden?* Washington, DC: Brookings Institution; 1993.
5. Stiglitz J. *Economics of the Public Sector*. 3rd ed. New York, NY: W.W. Norton & Co; 2000.
6. Manning WG, Keeler EB, Newhouse JP, Sloss EM, Wasserman J. The taxes of sin: do smokers and drinkers pay their way? *JAMA*. 1989;261:1604–1609.
7. Grossman MJ, Sindelar JL, Mullahy J, Anderson R. Policy watch: alcohol and

cigarette taxes. *J Econ Perspect*. 1993;7:211–222.

8. Cooper M. Cigarettes up to \$7 a pack with new tax. *New York Times*. July 1, 2002.

9. Pechman JA, Okner B. *Who Bears the Tax Burden?* Washington, DC: Brookings Institution; 1974.

10. Pechman JA. *Who Paid the Taxes 1966–1985?* Washington, DC: Brookings Institution; 1985.

11. Lyon AB, Schwab RM. Consumption taxes in a life-cycle framework: are sin taxes regressive? *Rev Economics Stat*. 1995;77:389–406.

12. Wasserman J, Manning WG, Newhouse JP, Winkler J. The effects of excise taxes and regulations on cigarette smoking. *J Health Economics*. 1991;10:43–64.

13. Action on Smoking and Health. Budget 2002: tobacco tax submission from health organizations. Available at: <http://www.ash.org.uk/html/smuggling/pdfs/tax2002.pdf>. Accessed November 1, 2002.

14. Economic Opportunity Institute. Health care policy note: rebuttals to arguments against cigarette tax increases 2001. Available at: <http://www.econop.org/HealthCare-PolicyNotes-August2001.htm>. Accessed November 23, 2002.

15. Globalink. The costs and consequences of tobacco control. Available at: <http://www.globalink.org/tobacco/wb/wb06.shtml>. Accessed November 1, 2002.

16. California Lung Association. Health and anti-tobacco organizations push hike in cigarette tax. Available at: <http://www.californialung.org/press/020320tobaccotax.html>. Accessed November 1, 2002.

17. Farrelly MC, Bray JW. Response to increases in cigarette prices by race/ethnicity, income, and age groups—United States, 1976–1993. *JAMA*. 1998;280:1979–1980.

18. Evans WN, Farrelly MC. The compensating behavior of smokers: taxes, tar and nicotine. *RAND J Economics*. 1998;29:587–595.

19. Seligman ERA. Progressive taxation in theory and practice. *Am Econ Assoc Q*. 1908;9:1–334.

20. Musgrave RA. A brief history of fiscal doctrine. In: Auerbach AJ, Feldstein M, eds. *The Handbook of Public Economics*. Amsterdam, the Netherlands: Elsevier; 1985:1–59.

21. Browning EK, Johnson WR. *The Distribution of the Tax Burden*. Washington, DC: American Enterprise Institute; 1979.

22. Poterba JM. Lifetime incidence and the distributional burden of excise taxes. *Am Econ Rev*. 1989;79:325–330.

23. Warner KE. The economics of tobacco: myths and realities. *Tob Control*. 2000;9:78–89.

24. Chaloupka FJ. Rational addictive behavior and cigarette smoking. *J Political Economy*. 1991;99:722–742.

25. Townsend JL, Roderick P, Cooper J. Cigarette smoking by socioeconomic group, sex, and age: effects of price, income and health publicity. *BMJ*. 1994;309:923–926.

26. Chaloupka FJ, Warner KE. The economics of smoking. In: Culyer AJ, Newhouse JP, eds. *Handbook of Health Economics*. Amsterdam, the Netherlands: Elsevier; 2000:1539–1628.

27. Schelling T. *Choice and Consequence*. Cambridge, Mass: Harvard University Press; 1984.

28. Becker GS, Grossman M, Murphy KM. An empirical analysis of cigarette addiction. *Am Econ Rev*. 1994;84:396–418.

29. Becker GS, Murphy K. A theory of rational addiction. *J Political Economy*. 1988;96:675–700.

30. Gruber J, Mullainathan S. *Do Cigarette Taxes Make Smokers Happy?* Cambridge, Mass: National Bureau of Economic Research; 2002. Working paper 8872.

31. Gruber J, Koszegi B. Is addiction 'rational'? Theory and evidence. *Q J Economics*. 2001;116:1261–1303.

32. Gruber J. Smoking's internalities. *Regulation*. Winter 2002–2003:52–57.

33. Leonhardt D. Economic view: how a tax on cigarettes can help the taxed. *New York Times*. April 14, 2002.

34. Viscusi WK. The new cigarette paternalism. *Regulation*. Winter 2002–2003:58–64.

35. Gruber J, Koszegi B. *A Theory of Government Regulation of Addictive Bads: Optimal Tax Levels and Tax Incidence for Cigarette Excise Taxation*. Cambridge, Mass: National Bureau of Economic Research; 2002. Working paper 8777.

36. Shlaes A. Wages of sin: how elastic is sin? *Am Spectator*. March–April 2002.